(No Model.) 2 Sheets—Sheet 1.

W. A. GUZEMAN.

ADDING MACHINE.

No. 427,567. Patented May 13, 1890.

Fig. 1.

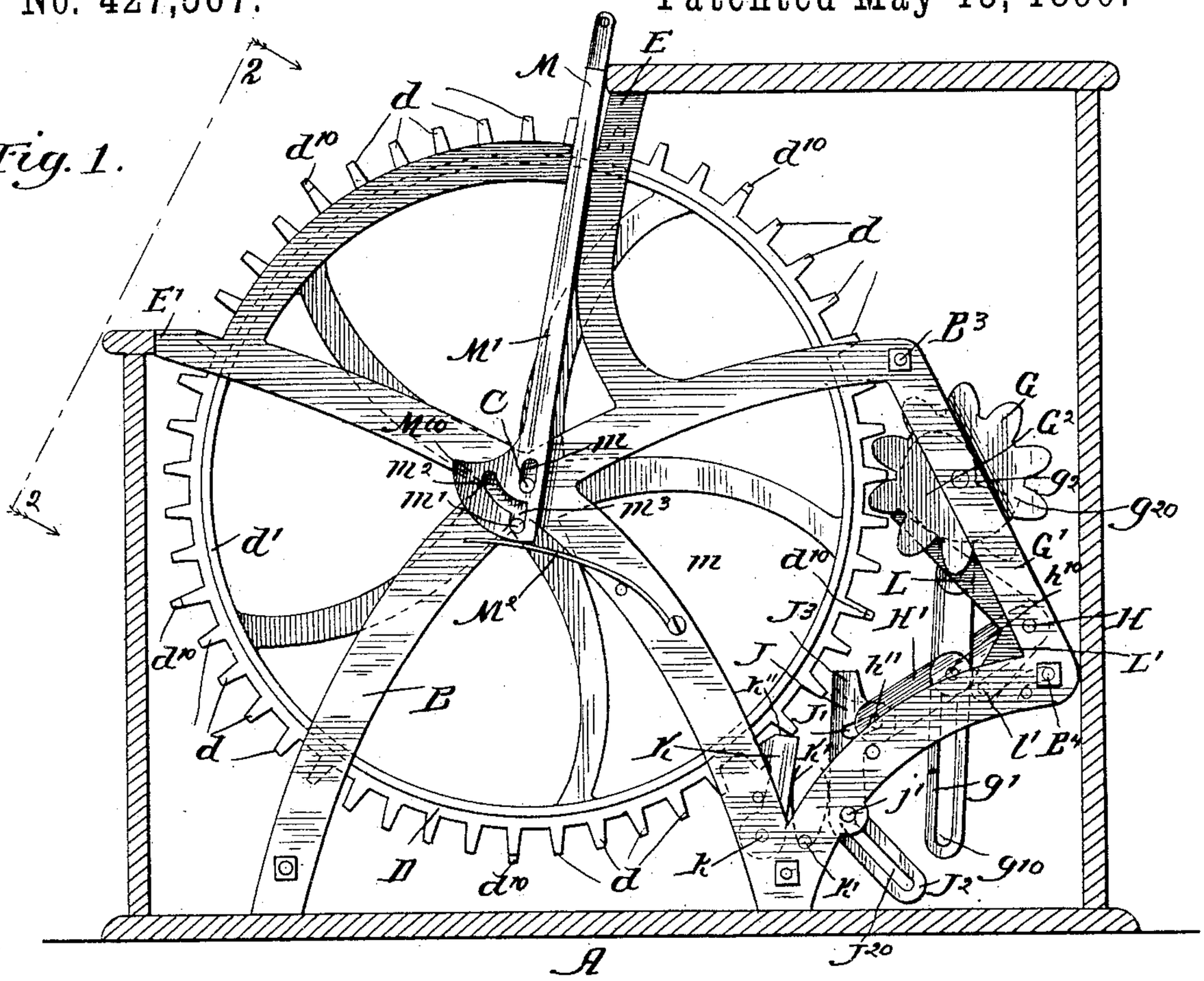


Fig. 4.

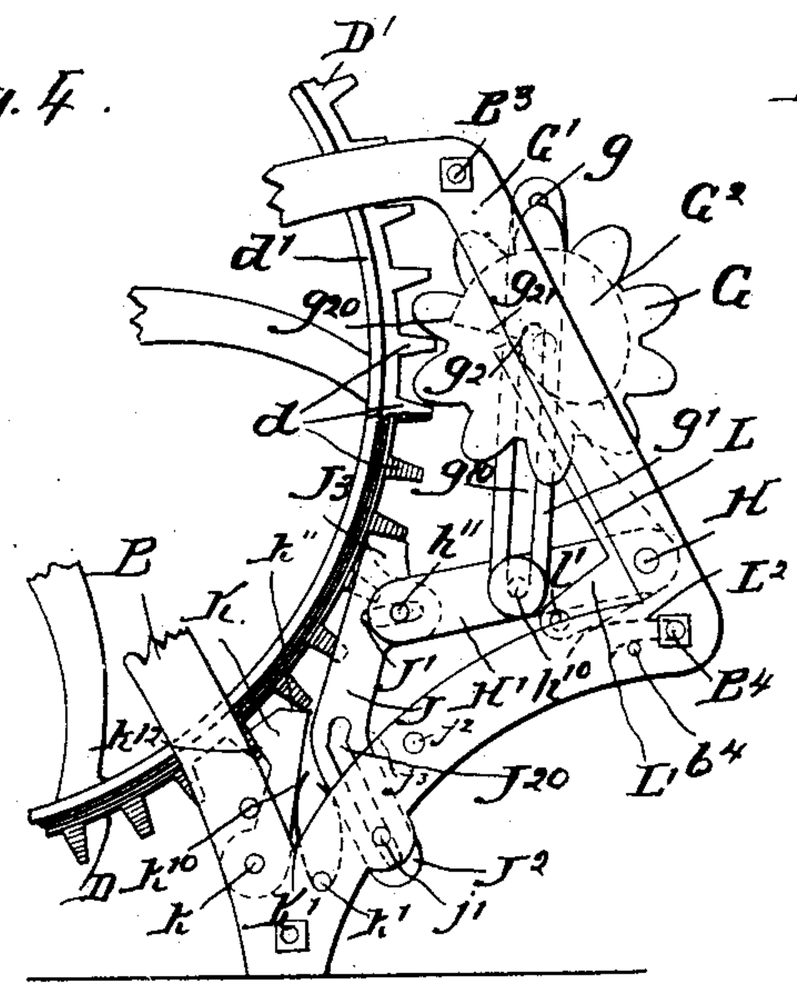
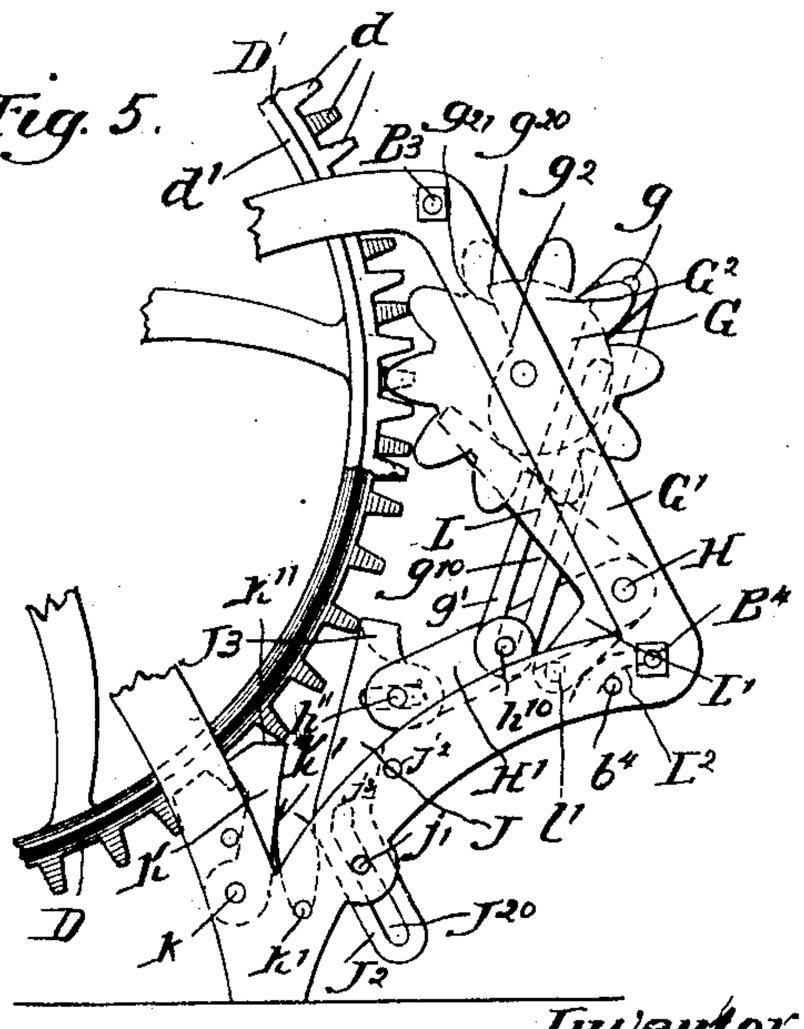


Fig. 5.



Witnesses:
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John R. Mattenstrom

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(No Model.) 2 Sheets—Sheet 2

W. A. GUZEMAN.

ADDING MACHINE.

No. 427,567. Patented May 13, 1890.

Fig. 2.

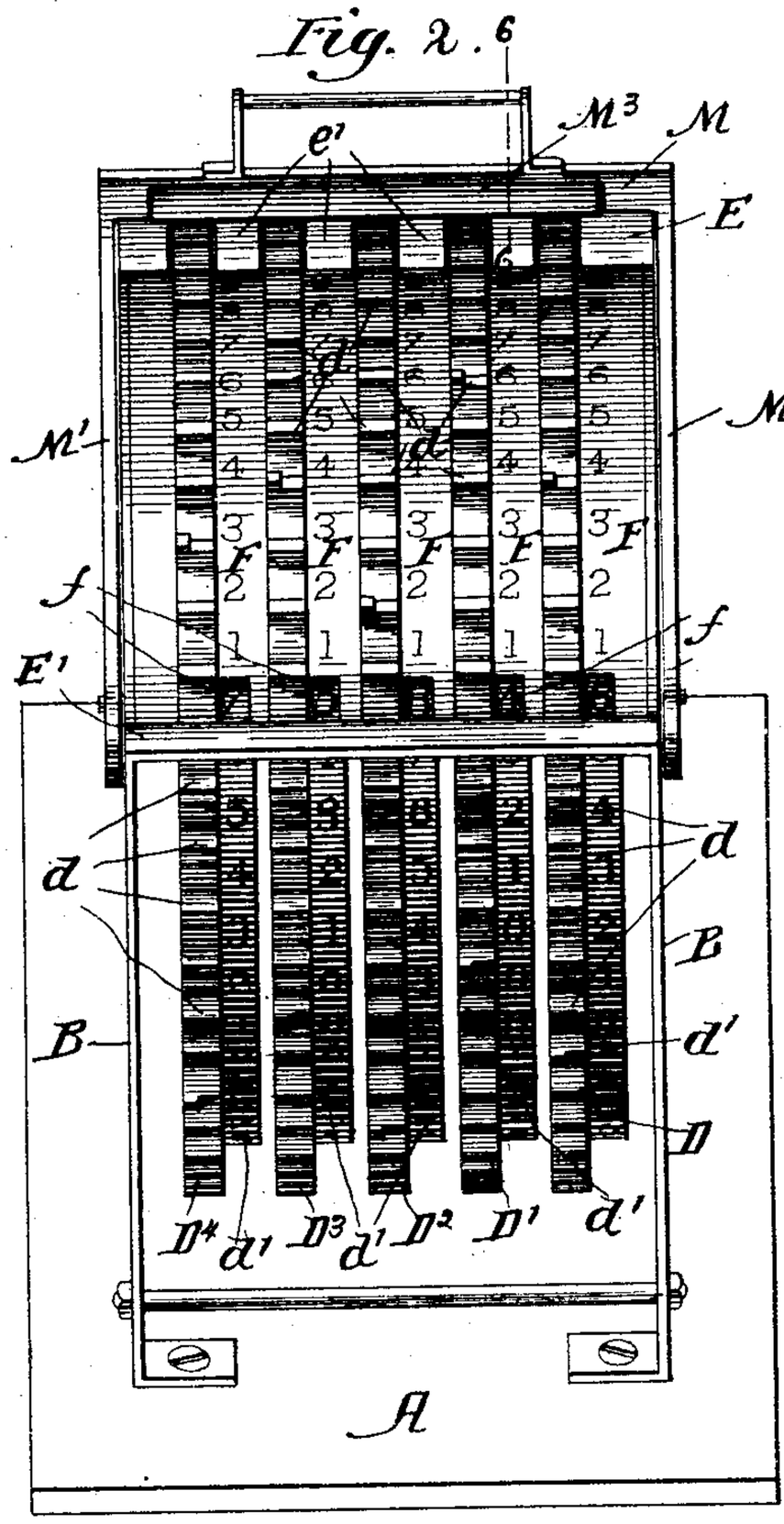


Fig. 3.

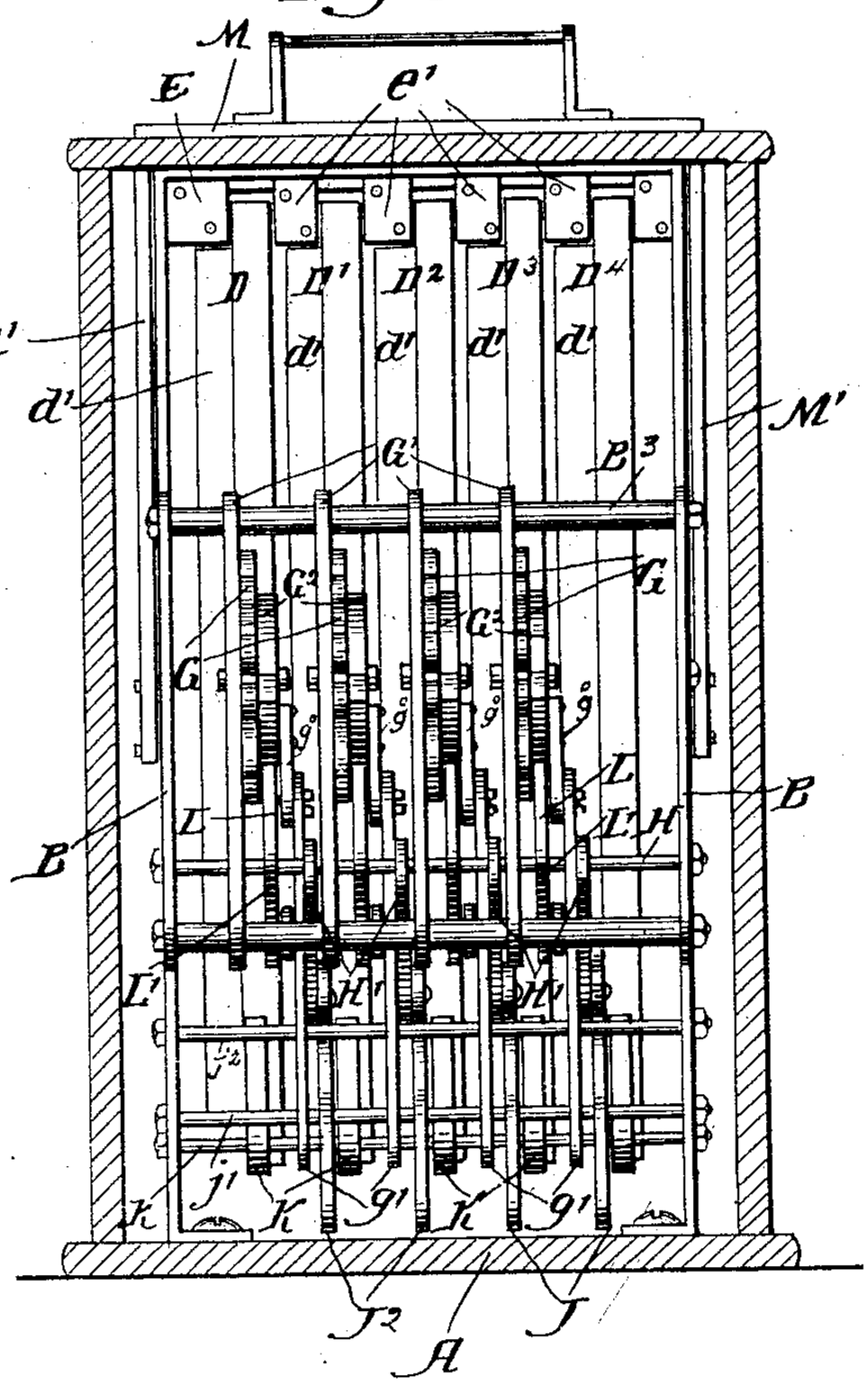
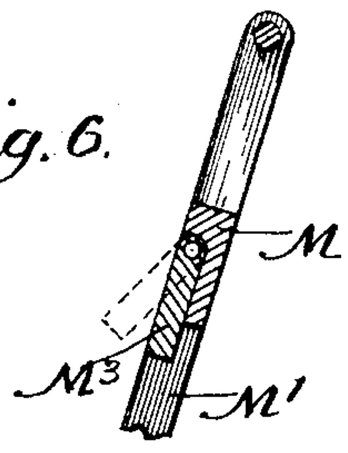


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM A. GUZEMAN, OF ENGLEWOOD, ILLINOIS, ASSIGNOR TO Z. ESTELLINE P. GUZEMAN, OF SAME PLACE, AND L. C. RIGGS, OF CHICAGO, ILLINOIS.

ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 427,567, dated May 13, 1890.

Application filed May 15, 1889. Serial No. 310,843. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. GUZEMAN, a citizen of the United States, residing at Englewood, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Adding-Machines, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

In the drawings, Figure 1 is a side elevation. Fig. 2 is a plan projected upon the plane of the line 2 2 on Fig. 1. Fig. 3 is a rear elevation. Fig. 4 is a detail side elevation of the feeding mechanism in a different position from that shown in Fig. 1. Fig. 5 is a similar detail side elevation showing the parts in a still different position. Fig. 6 is a section at 6 6 on Fig. 2.

A is the base of the frame, upon which the number-wheels are supported.

B B are side brackets, which sustain the several horizontal shafts upon which the various parts are journaled and pivoted.

C is the principal shaft, upon which the number-wheels are journaled.

D D′ D² D³ D⁴ are the number-wheels. Each of the number-wheels has teeth *d* to the number of fifty or any other multiple of ten, preferably not less than forty. These teeth occupy about one-half of the rim or flange of the wheel, the remainder of the rim *d′* being occupied by the figures in series from 0 to 9, inclusive, one figure for each tooth.

To the brackets B B there are secured the stop-bars E and E′, distant on the arc of the circle within which the wheels rotate eleven number-spaces—that is, so that eleven of the teeth *d* are included between them. Both the bars E and E′ are notched to allow the teeth *d* to pass them; but in the interval between the notches, extended radially with respect to the number-wheels almost down into contact with the rims *d′* and to the projecting portions *e′*, there are secured the number-plates F, one covering each of the rims *d′* and occupying the space that intervenes between said rims and the lower edge of the bars—that is to say, the lower ends of the downwardly-projecting portions *e′* of the bars. These number-plates at the lower or forward end—that is to say, the ends next the bar E′—are cut away about half their width, making the openings *f*, through which are exposed the numbered rims *d′* beneath them. The remainder of their extent between the bars E and E′ is occupied by a series of numerals. This cut-away portion is equal in extent to one of the spaces between consecutive teeth on the number-wheels, and, commencing back of that aperture *f*, the plates are provided with imprinted numerals from 1 to 9, inclusive, said numerals being placed correspondingly with the teeth and with the numerals on the number-wheels.

G G G are spur-wheels, having each ten teeth and adapted to be engaged by the teeth *d* upon the number-wheels D D′ D² D³ D⁴, one of the wheels G being meshed with each of the number-wheels, except the last at the left, so that the rotation of either of the number-wheels ten numeral-spaces will cause one complete rotation of the spur-wheel G which is meshed with it. In order that the teeth *d* may occupy the least possible portion of the periphery of the number-wheels and leave the largest possible spaces between them on said wheels, said teeth *d* are made, as illustrated, thin and flat, and the teeth of the wheel G, in order to mesh snugly and gear smoothly therewith, are necessarily wide and rounded, and with relatively narrow spaces between them, as illustrated. The relative forms of these teeth will be determined by the familiar rules for gear-cutting. Each of the wheels G is independently mounted upon a stud-axle provided upon a bracket G′, which projects from the rear horizontal bar B³ of the frame, and rearward from the line of the axes of said wheels G a horizontal shaft H is extended between the brackets B B, and on said shaft are pivoted levers H′ H′ H′, &c., one for each of the wheels G, and on the wrist-pin *g*, rigid with each of said wheels, there is pivoted a pitman-link *g′*. As illustrated, an arm g^0, made rigid with the cam G², which is rigid with the wheel G, carries the wrist-pin *g*. The link *g′* has the slot g^{10}, engaged with the laterally-projecting stud h^{10} on the level H′. The length of the slot is less than the entire distance which the link is reciprocated

by the rotation of the wheel G, so that by said rotation the lever H′ is lifted and would be depressed if it did not fall by gravity a short distance. To the forward and lower end of the lever H′ there is pivoted the carrying finger or dog J, which has the slot J′ for the pivot-stud h^{11} on the lever H′, so that in addition to pivotal motion it has a sliding motion back and forward, for a purpose which will hereinafter appear. Below its pivot the dog J is provided with the elongation J^2, which has the slot J^{20}, through which the horizontal shaft j' is inserted, whereby said shaft becomes a guide for the motion of the dog as it is actuated by the lever H′.

j^2 is a rod, which extends across the machine behind the dogs J and acts as a stop and guide for the dogs, causing them by the contact of the rear edge j^3 with the rod to swing forward at the upper end as they descend, and so enter under the next tooth of the number-wheel. This dog J, except as to the upper end, hereinafter described, stands in a vertical plane from front to rear a little aside from the plane of the right-hand edge of the number-wheel which it is to actuate, and from its left-hand side the projecting tooth J^3 stands in the plane of the teeth and is in such position as to actuate it at proper time, as hereinafter explained.

Upon the horizontal shaft k, supported upon the frame-brackets B B, there are pivoted the back-stop dogs K K K, &c., each in position to engage one of the number-wheels, and on the shaft k', supported at its ends in the bracket B, there are mounted the springs K′, located back of the dogs K, respectively, and having one end bearing upon them, tending to force them into engagement with their respective number-wheels. The other end of this spring bears against the forward edge of the dog J, except in the case of the spring which operates against the back-stop pertaining to the first number-wheel at the right, there being no carrying-dog J corresponding to that one, and in this case one end of the spring K′ is stopped on the frame-bracket B. The dog K has its head or tooth provided with the under face k^{12} and the upper face k^{11}, the former having such direction as to coincide substantially with the contacting surfaces of the teeth of the number-wheels when the dog is engaged between them, and the latter being oblique to the path of rotation of the points of the teeth, for reasons hereinafter explained.

Upon the left-hand side of each of the wheels G and made rigid with the wheel is a cam G^2, irregularly spiral in form, and upon the shafts H in the vertical plane of each of the cams G^2 there is pivoted a bell-crank lever L L′, having the arm L extending up into the vicinity of the cam and resting against its periphery, while the arm L′, extending nearly at right angles to the arm L, is provided at the lower end with a laterally-projecting stud l', which extends horizontally to the left underneath or behind the lever H′. A spring L^2, supported and stopped on the frame, most conveniently by being coiled around the rear frame-bar B^4, and having one end stopped on the cross-bar b^4, has the other end reacting against the shorter arm L′ of the bell-crank lever, tending to force it upward and forward until stopped by the contact of its stud l' with the lever-arm H, as described.

The operation of this mechanism as far as now described is as follows: All the number-wheels being set with 0 showing through the apertures f, any other figure may be made to show through any of the apertures—as, for instance, the units-aperture—by rotating the wheel corresponding thereto, and whose figure is to show the number of teeth indicated by the number which is to be caused to appear. This will be done by pressing the finger or suitable tool in the space between consecutive teeth d which stands adjacent the desired number on the plate F and rotating the wheel until the finger or tool is stopped by the bar E′. By thus rotating each of the wheels any number desired may be indicated through the apertures f. Any other number may be added thereto, and the sum indicated by following the same method in respect to such other number—that is, rotating each wheel the number of spaces indicated by the figure of the degree corresponding to the wheel in the number to be added. In this process the carrying is automatically performed by the mechanism located in the rear of the number-wheels, whose action will now be described.

Considering, for example, the units-wheel in rotating ten teeth or spaces causes the wheel G which meshes with it to perform one complete revolution, and in making this revolution before the pitman-link g' is lifted to its highest point, as seen in Fig. 4, the end of its slot g', engaging the stud h^{10} on the lever H′ adjacent to it at the left, lifts said lever, which in turn by means of its stud h^{11}, engaged in the slot J′ of the dog J, lifts said dog, bringing its tooth J^3 in contact with a tooth d of a second number-wheel D′, and while the pitman-link is passing to its highest point it carries the parts operated by it upward, as described, causing the dog J to rotate the second number-wheel one tooth—that is, one numeral-space. When the units-wheel or any other of the wheels is actuated, whether by the finger of the operator directly or by the carrying mechanism, each tooth as it passes the dog K forces it back out of engagement, and the dog, under the reaction of the spring K′, comes in underneath the tooth and locks it against return, the angle which its face k^{11} makes with the tooth of the number-wheel and the position of its pivot k with reference to the point of contact of the tooth with the face k^{11} being such that the dog becomes the positive stop against backward rotation of the wheel. In order to bring this second num-

ber-wheel, and in like manner to bring each succeeding number-wheel when it is actuated by the carrying mechanism, home to the point where it ought to stand at each actuation, I provide the dog K with the oblique face k^{11} described, which stands at such an angle to the point of the tooth next above it that although positively stopping reverse motion, as stated, yet if when the dog is forced into its notch by its spring the number-wheel has not advanced fully to its proper position said oblique face k^{11} would strike on the point of the tooth at such an angle thereto that the pressure of the spring K′, even though that should not be very great, would cause the dog to feed the wheel forward as it was forced into the notch and until the other edge k^{12} of the dog should stop against the next tooth under it, as seen in the several figures.

In order that slackness of the joints or lost motion caused by wear therein at other points than the one just described may not cause inaccuracy in the operation of the device, the mechanism related to the cam G^2 is provided. The lowest point g^2 of said cam G^2 is located at such position thereon with respect to the wrist-pin g that the end of the lever-arm rests upon it at that point when the wrist-pin is at the highest point—that is, while the dog J is at its highest point and has completed its feeding action upon the number-wheel with which it is engaged. If by reason of the looseness of the joints the pitman-link g' fails to lift the dog to the proper point when the link is at its highest position, the spring L^2, acting against the lever L L′ and forcing its arm L′ as far up as the contact of the arm L with the cam G^2 will permit, will correct such defect in the action by the reason of the engagement of the stud l' under the lever H′, lifting the latter, and thereby the dog J, to its proper position. The spring L^2 is compressed and power stored therein for the purpose of such reaction throughout the revolution of the wheel G by the spiral cam G^2 crowding the lever-arm L′ outward from the center of the wheel and holding it out until the point of the lever runs off the corner g^{20} of the cam. In order to correct any excessive looseness or lost motion which may exist between the number-wheels and the gear-wheels G, meshed with them, respectively, I make the edge g^{21} of the cam in such relation to the arc described by the end of the lever-arm L as it moves toward the center of the wheel that the motion of said arm will crowd the wheel around somewhat in its normal direction of rotation, thereby causing the spring L^2 not only to correct any error due to lost motion in the several joints between the links and levers of the carrying mechanism, but also to correct any error due to inaccurate meshing of the number-wheels with the gear-wheels G. When this mechanism is operated rapidly, the impetus given to the wheel actuated by the carrying-dog (that wheel not being under the finger of the operator and so not checked when the motion of the finger is stopped by the bar E′) might sometimes cause the wheel to be fed more than one notch. This result I aim to prevent by the back-stop dog K, and for that purpose this dog is provided with its tooth, as shown, having the face or edge k^{12}, which, when the tooth is engaged with the wheel, coincides with the face of the tooth next under it, so that, although by reason of the relative position of the face thus engaged and the pivot of the dog the rotation of the wheel under such positive pressure as it receives from the operator or from the carrying mechanism will force the dog back and permit the wheel to revolve, yet the engagement of said dog with the tooth will arrest the action of the wheel which it might have under the mere momentum acquired from the sudden actuation of the carrying-dog, as explained; but in order that this may not cause the number-wheel to be too difficult to operate it is desirable that the pressure of the spring which holds the dog K in engagement, as described, with the wheel shall be as slight as possible at the instant when the operator is moving the wheel, and shall become greatest at the time when such pressure is desirable in order to arrest the wheel, as described, and for this reason one end of the spring K′ is stopped against the under or forward edge of the tail of the dog J, the movement of this dog being controlled by the direction of its slot J′, and that direction being such that the dog moves forward at its lower end—that is the part below the pin h^{11}—while it causes the spring K′ to be compressed by the dog, that compression being greatest at the instant of the completion of the proper feeding action of the dog. It will be observed that this is the very instant at which it is most important that the dog K should have its described engagement with the tooth of the number-wheel to stop it from over rotation and should enter promptly between the teeth of the wheel for that purpose. It will thus appear that the spring K′ exerts very light pressure upon the dog, indeed barely sufficient to sustain its weight at the time when the operator commences to rotate the wheel, so that such rotation easily throws the dog out of engagement, and that at the instant when the dog should be thrown back into engagement the pressure of the spring is greatest, and is therefore most certain either to correct deficient rotation by the engagement of its oblique edge k^{11} with the tooth in advance of it or to prevent over rotation by the engagement of its face k^{12} with the tooth behind it.

I have described thus far the portion of the action of the carrying mechanism during which it performs its work. It remains to be noticed that when the wrist-pin g has passed the highest point and the pitman-link g' begins to descend, if the machine is in the position illustrated, the lever H′ and the dog J will descend by gravity, unless the action of the

spring L^2 causes the lever-arm L′ to uphold for a time the lever H′; but in order to prevent this the cam G^2 is so shaped that it forces downward the said lever fast enough to keep its stud l' out of the way of the lever H′ while it is descending by gravity. The action, therefore, is in this respect unaffected by the cam G^2; but if for any reason the parts should fail to descend, then when the upper end of the slot g^{10} reaches the stud h^{10}, the engagement of the pitman-link with the lever H′ thereby becoming positive, said lever will be forced downward and will carry downward with it the dog J. In the downward motion of the dog J, whether it is due to gravity or to the positive actuation of the pitman-link g', its tooth which by its upper edge feeds the wheel when it is moved upward now rests on the tooth behind it as it descends and slides off of it rearward in order to pass it in its descending motion. This rearward motion is permitted by reason of the slot J′ at which the pivotal connection of the dog and lever H′ is made. It will be noticed that in the upward or feeding movement of this dog, after it comes in contact with the tooth which it is to engage and by which it is to feed the number-wheel, its upper end must move rearward, following the curvature of the wheel. The slot J′ is designed to be formed in such direction that it will compel this rearward motion as the dog is lifted; but if the slot should not be sufficiently accurate or should not be closely enough fitted to the guiding rod or shaft the same result will be accomplished by the number-wheel itself, which, as it is revolved by the pressure of the dog, will carry rearward the end of the dog, which will slide at its pivotal connection with the lever H′ in the same manner as when descending.

For the purpose of readily setting all the number-wheels at 0 at the commencement of any computation I provide the setting-bar M, which is a horizontal bar extending across the machine above the number-wheels, supported on two lever-arms M′ M′, which extend down, one at each end, outside the frame-brackets B B and are pivoted on the protruding ends of the shaft C, said shaft entering a slot m, formed in the arm M′, so that the arms and the bar M may have a vertical motion on the shaft, as well as a rocking motion about it. A spring M^2, secured and stopped on the bracket B, extends under the lower ends of each of the arms M′ and reacts upward against it, tending thereby to uphold said arms and the bar M. Upon each of the brackets B there is provided a stud m' below the shaft-bearing, and the lower ends of the lever-arms M′ are sectorally expanded at M^{10}, said sectoral expansion having a curved slot m^2, which receives the stud m', and has at the rear end the recess or notch m^3, having the same direction and the same longitudinal extent as the slot m. To the face of the bar M there is pivoted the lip M^3, free to swing forward at its lower edge, but stopped by the bar against swinging backward. On the number-wheels each tooth which stands next below the zero figure thereon—that is to say, between 9 and 0—is elongated for about half of its width, forming the supplemental tooth d^{10}, projecting beyond the cylinder, which would be described by the other teeth in their rotation. When the lever-arms M′ are at their highest position, as upheld by the springs M^2, the stud m' and the shaft C being at the bottom of their respective slots in said lever-arms, the lip M^3 is above the points of the extended or supplemental teeth d^{10}. When the bar is depressed, the lever-arms M′ forcing downward the spring M^2 until the upper end of the slot m comes in contact with the shaft, the lip M^3 on the bar M is barely high enough to clear the points of the teeth d, and is therefore in position such that when the bar M is rocked forward the lip will collide with the projecting teeth d^{10}. It will be evident that each of the number-wheels will at all times have one such tooth standing between the bars E and E′, and when the bar M is swept forward, the arms M′ rocking upon the shaft, the lip M^3 on said bar will gather up all of these projecting teeth against itself and sweep them forward to the limit of its play—that is, to the stop-bar E′—and that when it is arrested by said bar and the zero teeth—that is, the teeth having the projecting teeth—are thus brought in line with that bar the figure 0 will show on all the wheels through the apertures f just above that bar. If before this movement is performed any one of the wheels has a zero exposed through the aperture f, it is evident that the tooth d' corresponding to that particular zero would not be engaged by the lip M^3 on the bar M except at the limit of its motion, and would not then be actuated by it; but if it should happen that the preceding number-wheel stood in such position that the motion which it would receive from the bar, as described, would cause its carrying mechanism to actuate the next wheel, which already stands at 0, such wheel would be moved one tooth while the setting-bar was making its sweep, and would therefore register 1 instead of 0 when the motion of the setting-bar was completed, unless some other means were provided for actuating such wheel, the engagement of the lip of the setting-bar with the tooth corresponding to the exposed zero of such wheel. This difficulty I have overcome by separating the bars E and E′ a distance of eleven spaces of the number-wheels, so that the setting-bar in its setting movement moves over eleven spaces. If, now, any wheel register zero, when the setting is commenced another zero, will be exposed adjacent to the bar E, and there will be, therefore, one of the teeth d' standing just in front of that zero, and the setting-bar lip will therefore engage behind this tooth when it is depressed, and such wheel will therefore be the first to receive the actuation of the setting-bar, and the movement which, but for this

feature of construction, would be given it by the carrying mechanism is performed by the setting-bar before the carrying mechanism has opportunity to act, and when that mechanism does act it can only tend to produce precisely the same movement of the wheel which the setting-bar is already producing, and therefore cannot carry the wheel farther than it would be carried by said bar. Every tooth d^{10} engaged by its lip M^3 during its said movement remains in engagement with it, and the zeros which stand next above those teeth will all be exposed through the apertures *f*.

The purpose served by the sectoral termination M^{10} and the slot m^2 m^3 therein is that the setting-bar cannot by any accident be rocked forward without being depressed the full distance necessary to make its lip M^3 engage the teeth d^{10}, and that having performed its setting movement it must of necessity return the entire distance to its place of rest before it can rise to its initial position high enough so that the lip M^3 is above the path of the teeth d^{10}.

I claim—

1. In combination with the peripherally toothed and numbered wheels journaled side by side, each having teeth and numbers to the number of some multiple of ten, the ten-toothed wheels meshing with the peripheral teeth of said number-wheels, respectively, the slotted pitman-link actuated by said ten-toothed wheels, and a lever pivoted to the frame and actuating the carrying-dog, said lever connected to said slotted pitman in said slot, whereby the pitman actuates the lever, and thereby the dog, only near the limits of the motion which it receives from the ten-toothed wheels, substantially as set forth.

2. In combination with the peripherally toothed and numbered wheels constructed and journaled substantially as described, the ten-toothed carrying-wheels meshing with the numbered wheels, respectively, the pitman-links pivoted to the ten-toothed wheels, respectively, and reciprocated thereby, levers pivoted on the frame and actuated by said pitman-links, and the carrying-dogs pivoted to said levers and having each a tooth which engages the next numbered wheel, and having an extension on the opposite side of its pivot from the tooth, and a guide on the frame for said extension, whereby the path of motion of the tooth is controlled, substantially as set forth.

3. In combination with the peripherally toothed and numbered wheels, ten-toothed wheels meshing with said number-wheels, respectively, and the mechanism by which said ten-toothed wheels actuate the carrying-dogs, respectively, levers actuated by the ten-toothed wheels, respectively, once in each complete rotation of said wheels, and springs reacting against said levers and resisting the movement communicated thereto by the wheels, said levers operating upon the carrying-dog-actuating mechanism and being released from actuation of the wheels once in each revolution of the latter, whereby at the instant of such release said levers are moved by the reaction of the springs to communicate power to the carrying-dog-actuating mechanism, substantially as set forth.

4. In an adding-machine, in combination with the peripherally toothed and numbered wheels having teeth and numbers to the number of some multiple of ten, ten-toothed wheels which mesh with the peripheral teeth of the numbered wheels, respectively, and carrying mechanism actuated by said ten-toothed wheels, each of said wheels having a cam rigid with it, a series of levers actuated by said cams, respectively, and a series of springs resisting the movement of the levers under such actuation, said levers being released from the cams once in each revolution of the wheels and at that instant engaging the carrying mechanism, whereby the reaction of the springs causes said levers to actuate said carrying mechanism, substantially as set forth.

5. In combination with the peripherally-toothed wheels, the carrying-dogs J and the locking-dogs K, each of the dogs having the tooth which engages the number-wheel provided with the face k^{12}, adapted to engage the teeth of said wheel, the guide on the frame which controls the movement of each of the dogs J causing it to move toward the dog K in the movement by which it operates the wheel, and the spring reacting against the dog K and compressed by the dog J in said movement of the latter, whereby the tension of said spring is made greatest at the instant that the carrying movement is completed and the dog K brought into engagement with the number-wheel, substantially as and for the purpose set forth.

6. In combination with the number-wheel peripherally toothed, the dog K, adapted to engage it to prevent its reverse rotation, the tooth of said dog which thus engages the wheel having a face k^{11}, sloping obliquely with respect to the movement of said dog about its pivot toward the wheel and with respect to the tooth of the wheel which it stops, whereby the dog, entering behind the tooth which it stops, tends by the engagement of said oblique face k^{11} with said tooth to complete the rotation of the wheel one tooth-space if the same is not fully completed by the other mechanism, substantially as set forth.

7. In an adding-machine, in combination with the number-wheels peripherally provided with teeth to the number of some multiple of ten, the ten-toothed carrying-wheels, the cams G^2 thereon, the lever H, pivoted on the frame and having one end engaged by the cam, the carrying mechanism operated by the ten-toothed wheels, having a lever in position to be engaged by the lever H, and a spring which reacts against said lever H to resist the actuation of the cam and tending to return the lever to its initial position on the cam once in

each rotation of the latter, whereby at that point the spring tends to actuate the carrying mechanism, substantially as set forth.

8. In an adding-machine, in combination with peripherally toothed and numbered wheels located side by side, each having teeth to the number of some multiple of ten, each tenth tooth having a projection beyond the remainder, the setting-bar having the rock-arms M^{10} pivoted to the axis of the wheels and adapted to rock through eleven numeral-spaces thereabout, said rock-arms being slotted at their pivots, and the setting-bar being adapted to engage the projection on the tenth tooth when it is in one position allowed by said slots, but being out of engagement with said projections when it is at the other position, substantially as set forth.

9. In combination with the number-wheels having peripheral teeth the number of some multiple of ten and each tenth tooth provided with a projection, the setting-bar having the rock-arms M′, pivoted at the axis of the wheels and having the slot *m*, by which they are journaled on upper pivots, and the spring M^2, tending to uphold said rock-arms and bar out of the path of rotation of the projections of the tenth teeth of the number-wheels, substantially as set forth.

10. In combination with the number-wheels having peripheral teeth to the number of some multiple of ten, each tenth tooth being provided with a projection, the setting-bar having the rock-arms M′, each of said rock-arms having a slot *m*, by which it is journaled on its pivot, and having also the slot m^2 m^3, having the same direction and extent as the slot *m*, and having the part m^2 in an arc about the upper end of the slot *m*, the stud *m*′, fixed with respect to the pivot of the rock-arms and engaging the slot m^2 m^3, and removed from said pivot a distance equal to the distance from the upper end of the slot *m* to the upper end of the slot m^3, and springs M^2, tending to hold said rock-arms up to the limit allowed by their slots, respectively, the setting-bar being at that position out of the path of the projections of the tenth teeth, substantially as and for the purpose set forth.

In testimony whereof I have set my hand, in the presence of two witnesses, at Chicago, Illinois, this 8th day of April, 1889.

W. A. GUZEMAN.

Witnesses:
CHAS. S. BURTON,
JEAN ELLIOTT.